

**U.S. Department of the Interior
Bureau of Land Management**

Environmental Assessment

**EOG Alger Pass Wells
DOI-BLM-UT-G010-2015-034-EA
May 2015**

PREPARING OFFICE

U.S. Department of the Interior
Bureau of Land Management



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Prepared by
U.S. Department of the Interior
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Chapter 1. Introduction

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1.1. Identifying Information:

1.1.1. Title, EA number, and type of project:

EOG Resources, Inc. Proposes to drill two new Federal Gas Wells on BLM Surface in Alger Pass, Uintah County, Utah

Environmental Assessment DOI-BLM-LLUTG010-2015-0034-EA

1.1.2. Location of Proposed Action:

Section 10, Township 11 South, Range 19 East SL B&M

1.1.3. Name and Location of Preparing Office:

U.S. Department of the Interior
Bureau of Land Management
Vernal Field Office
170 South 500 East
Vernal, UT 84078
Phone: (435) 781-4400
FAX: (435) 781-4410

1.1.4. Identify the subject function code, lease, serial, or case file number:

Federal Lease UTU-70848

1.1.5. Applicant Name:

EOG Resources, Inc.

1.2. Purpose and Need for Action:

The underlying need for the proposed action is for EOG Resources, Inc. to develop Federal Lease UTU-70848 by drilling the proposed wells, and if successful, to produce commercial quantities of natural gas from its Federal oil and gas lease. There are known hydrocarbon-trapping mechanisms within EOG's development program, based on a previously drilled wells and reasoned geologic formation and mineral potential information.

Private exploration and production from Federal oil and gas leases is an integral part of the BLM oil and gas leasing program under authority of the Mineral Leasing Act of 1920, as amended by the Federal Land Policy and Management Act of 1976 and the Federal Onshore Oil and Gas Leasing Reform Act of 1987. The operator has a valid existing right to extract mineral resources from Federal Lease UTU-70848 subject to the lease's terms and conditions. The BLM oil and gas

leasing program encourages development of domestic oil and gas reserves and the reduction of U.S. dependence on foreign energy sources.

The BLM's purpose is to allow beneficial use of the applicant's lease in an environmentally sound manner.

1.3. Scoping, Public Involvement and Issues:

The Proposed Action was posted to the Utah BLM's NEPA Register on February 23, 2015. No public interest has been expressed.

Issues identified by BLM Specialists are documented in Appendix A Interdisciplinary Team Checklist

Chapter 2. Proposed Action and Alternatives

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2.1. Description of the Proposed Action:

EOG Resources, Inc. proposes to drill two new gas wells on BLM administered lands in Section 10, T11S, R19E, Salt Lake Meridian, in the Alger Pass area in Uintah County, UT. The proposed Project Area is located approximately 53 miles south of Vernal, Utah. The following table (**Table 2**) summarizes the disturbance potential for the Proposed Action. Each component addressed in **Table 2** is discussed in greater detail in the subsequent subsections.

Table 2. Surface Disturbance Associated with the Proposed Action Alternative

Well Name and Number	Access Road	Surface Pipeline (40 ft. temporary .corridor width)*	Well Pad	Total disturbance
Alger Pass 2-10	1,320 feet (40 ft. corridor width) 1.21 acre	1,867 feet (20 ft. permanent corridor width) 0.85 acre	1.84 acres	3.90 acres
Alger Pass 3-10	2,640 feet (40 ft. corridor width) 2.42 acre	3,507 feet (20 ft. permanent corridor width) 1.61 acre	1.84 acres	5.87 acres

* Permanent pipeline corridor width was used to determine surface disturbance because a surface pipeline is not anticipated to disturb the entire temporary construction corridor width.

2.1.1. Access

Approximately 3,960 feet of new access road would be needed to access the proposed location(s). Total new surface disturbance to the land from the new access roads would be approximately 3.63 acres. The access road would be crowned, ditched, and constructed with a permanent running surface of 18 feet and a maximum disturbed width of 40 feet. Approximately 12 feet of the access road corridor width would undergo reclamation following completion of the access road construction. If the reclamation efforts are successful then the disturbed acreage would be lessened to approximately 1.46 acres. Graveling or capping the roadbed would be performed as necessary to provide a well-constructed, safe road that minimizes the potential soil and vegetation losses. If construction occurs in winter months, then the proposed road would be cleared of any snow and allowed to dry completely prior to initiation of construction.

Surface disturbance and vehicular traffic would be limited to the proposed location(s) and proposed access route(s). Any additional area needed would be approved in advance. All construction would be in conformance with the standards outlined in the BLM and Forest Service publication *Surface Operating Standards for Oil and Gas Exploration and Development* (2007), also referred to as the “Gold Book”.

The road surface and shoulders would be kept in a safe and usable condition and would be maintained in accordance with the original construction standards. All drainage ditches would be kept clear. The access road surface would be kept free of trash during operations. All traffic would be confined to the approved disturbed surface. Road drainage crossings would be designed so they would not cause siltation or accumulation of debris in drainage crossings, nor would the drainages be blocked by the road bed. Erosion of drainage ditches by runoff water would be

prevented by diverting water off at frequent intervals by means of cutouts. Should mud holes develop, they would be filled in and detours around them avoided. When the snow would be removed from the road during the winter months, the snow would be pushed outside of the borrow ditches, and the turnouts kept clear so that snowmelt would be channeled away from the road.

2.1.2. Pipelines

Approximately 5,374 feet of surface pipeline would be installed adjacent to the access corridor for the proposed well location(s). There would be one 4" steel natural gas gathering line installed to serve each proposed well location. The pipeline corridor would have a temporary 40 foot width during construction, and a 20 foot permanent width for the life of the pipeline. The total disturbance associated with construction and installation of the pipelines would be approximately 2.46 acre. A BLM right-of-way would not be required for the pipelines because the entire length of the pipelines are located on BLM land and fall entirely within Federal lease UTU-70848.

2.1.3. Well Site Layout

The pad, reserve or cuttings pit, cuts, fills, and soil and rock storage piles would amount to approximately 3.69 acres of new surface disturbance. Surface and subsoil materials in the immediate Project Area would be used for construction. Any necessary additional gravel would be obtained from a commercial source.

2.1.4. Surface Facilities

All production facilities would be located on the disturbed portion of the well pads and a minimum of 25 feet from the toe of the back slope or the top of the fill slope.

A dike/berm would be constructed completely around those production facilities which contain fluids (i.e., production tanks, produced water tanks, and/or heater-treater). It would be either constructed of compacted subsoil, steel, or other impervious material, hold 110% of the capacity of the largest tank, and be independent of the back cut.

All permanent (on-site six months or longer), above ground structures constructed or installed, including pumping units, would be painted a flat, non-reflective, earth tone color to match one of the standard environmental colors, as determined by the five state Rocky Mountain Inter-Agency Committee. All facilities would be painted within six months of installation. Facilities complying with the Occupational Safety and Health Act (OSHA) would be excluded. The requested color is Carlsbad Canyon. This also meets the management objectives laid out in the 2008 Vernal RMP decision.

Drill cuttings and fluid would be contained on the well pads in the reserve pit. These will be disposed by evaporation in the reserve pit, through natural or artificial methods, and/or removed and disposed of at an authorized disposal site.

The flare pit will be constructed on the well pad and will be located downwind of the prevailing wind direction (South side of the location for North Alger 2–10 Southwest corner for North Alger 3–10) and a minimum of 100 feet from the well head and 30 feet from the reserve pit fence.

The reserve pit would be constructed on the well pad and would not be located within natural drainages, where flood hazards exist or surface runoff would destroy or damage the pit walls. The reserve pit would be constructed so that it would not leak, break, or allow discharge of liquids. A layer of plastic reinforced liner would be used in the pit. It would be a minimum of 16 ml thick lining, with a layer of double felt bedding, weed free straw/hay or soil to cover any rocks. The liner would overlap the pit walls and be covered with dirt and/or rocks to hold it in place. No trash or scrap that could puncture the liner would be disposed of in the pit.

The reserve pit would be fenced on three sides during drilling operations and on the fourth side when the rig moves off location. It would be fenced, and the fence maintained, until the pit undergoes reclamation. Any other necessary pits would be properly fenced to protect livestock or wildlife from entry. The fence would be maintained until such time as the pits are backfilled. A 39-inch net wire would be used with at least one strand of barbed wire on top of the net wire. Barbed wire would not be necessary if pipe or some type of reinforcement rod is attached to the top of the entire fence. The net wire would be no more than 2 inches above the ground. The barbed wire would be 3 inches over the net wire. Total height of the fence would be at least 42 inches. Corner posts would be cemented and/or braced in such a manner as to keep the fence tight at all times. Standard steel, wood, or pipe posts would be used between the corner braces. Maximum distance between any two fence posts shall be no greater than 16 feet. All wire would be stretched using a stretching device before attachment to the corner posts.

2.1.5. Water Supply

Water for drilling and cementing purposes would be obtained from any of the following sources: Ouray Municipal Water Plant or Bonanza Power Plant water source (water right number 49-225(A31368)). The Ouray Municipal Water Plant is considered an historic depletion because it is a municipal water source and the water does not enter the River System. The Bonanza Power Plant water source is considered an historic depletion because it was permitted December 12, 1960 (prior to the January 1988 date set for new (non-historic) depletions under the 1993 Recovery Implementation Program).

On January 21-22, 1988, the Secretary of the Interior; the Governors of Wyoming, Colorado, and Utah; and the Administrator of the Western Area Power Administration were cosigners of a cooperative agreement to implement the Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River Basin (Recovery Program) (US Fish and Wildlife Service (USFWS) 1987). An objective of the Recovery Program was to identify reasonable and prudent alternatives that would ensure the survival and recovery of the four endangered Colorado River fish species while providing for new water development in the Upper Colorado River Drainage Basin.

The water used for this project would be obtained from the state water rights listed above, which are historic depletions (permitted prior to January 1988). The USFWS addresses new and historic depletions differently under the Section 7 agreement of March 11, 1993. Historic depletions, regardless of size, do not pay a depletion fee to the Recovery Program. Also, consultation for historic depletions was conducted in association with the 1993 agreement.

2.1.6. Hazardous Materials

No chemicals subject to reporting under SARA Title III (hazardous materials) in an amount greater than 10,000 pounds would be used, produced, stored, transported, or disposed of annually in association with the drilling of this well. Furthermore, no extremely hazardous substances, as defined in 40 CFR 355, in threshold planning quantities, would be used, produced, stored, transported, or disposed of in association with the drilling of this well.

2.1.6.1. Waste Disposal

Drill cuttings would be contained and buried in the reserve pit. Drilling fluids, including salts and chemicals, would be contained in a tank or the reserve pit. Upon termination of drilling and completion operations, the liquid contents of the tank or reserve pit would be disposed of either through natural or artificial evaporation methods, or removed and disposed of at an approved waste disposal facility within 120 days after drilling is terminated. Any spills of oil, gas, produced (salt) water, or other noxious fluids would immediately be cleaned up and removed and taken to an approved disposal site.

A chemical porta-toilet would be furnished with the drilling rig. Garbage, trash, and other waste materials would be collected in a portable, self-contained, fully enclosed trash cage during operations. No trash would be burned on location, or buried in the reserve pit. All debris and other waste material not contained in the trash cage would be cleaned up and removed from the location immediately after removal of the drilling rig. Drip pans and absorbant pads will be used on the drilling rig to avoid leakage of oil to the pit.

2.1.7. Invasive Weeds

The operator would control invasive plants and noxious weeds along corridors for roads, pipelines, on well sites, and/or other applicable facilities. If herbicides or pesticides are used a Pesticide Use Proposal (PUP) must be submitted and approved prior to the use of these control mechanisms.

2.1.8. Reclamation

2.1.8.1. Producing Location/Interim Reclamation

Immediately upon well completion, the location and surrounding area would be cleared of all unused tubing, equipment, debris, materials, and trash. Any hydrocarbons in the pit would be removed in accordance with 43 CFR 3162.7-1. The reserve pit (if applicable) and the portion of the well pad not needed for production facilities/operations would be recontoured to the approximate natural contours. The reserve pit would be reclaimed within 90 days from the date of well completion, or as soon as environmental conditions allow. The stockpiled pit topsoil would then be spread over the pit area and broadcast or drill seeded (preferred method) with an interim seed mixture approved by the BLM Authorized Officer (AO) preferably after August 15th and prior to ground freezing. The seed mixture would be worked into the topsoil with a drill seeder, bulldozer or other heavy equipment. If initial seeding is not successful, reseeding may be required.

2.1.8.2. Topsoil

Topsoil would be stockpiled separately from other soil materials (subsoil), and maintained for future use in rehabilitating the location. Topsoil will be stored in a location that provide easy access for interim reclamation and protection of the topsoil. Topsoil piles stored beyond one growing season would be stabilized and possibly seeded to prevent loss of topsoil by erosion processes. Upon completion of construction the stockpiled topsoil from the location will be seeded with the approved seed mixture.

2.1.8.3. Pipeline Reclamation

Following pipeline installation activities, all disturbed areas would be re-contoured back to the original contour or a contour that corresponds with the surrounding landforms. Salvaged topsoil would be re-distributed evenly, and to pre-disturbance depths, over the surfaces to be revegetated. The soil surface would be prepared to provide a seedbed for re-establishment of desirable vegetation.

Site preparation may include gouging, scarifying, dozer track-walking, mulching, or soil additives. The seedbed preparations would be determined by the appropriate surface managing agency (SMA) at the time of final reclamation. Soil compaction would be reduced to the anticipated root depth of the desired plant species (usually 18 to 24 inches in a cross hatch manner where practicable). Disking may be necessary to eliminate large soil clumps or clods.

Methods such as hydro-mulching, straw mat application on steeper slopes, soil analysis to determine the need for fertilizer, seed-bed preparation, contour furrowing, watering, terracing, water barring, and the replacement of topsoil would be implemented as directed by the SMA.

After pipeline installation is complete, all disturbed areas would be reseeded. The seed mixtures to be used would be similar to the vegetation of the surrounding areas and may consist of grasses, forbs, or shrubs. The seeding contractor would provide all seed tags to the appropriate SMA prior to seeding efforts. Seeding would occur after August 15th and prior to winter freezing of the soil. Drill seeding would be used except in areas where topography or substrate composition (rock) precludes the use of the drill. If drill seeding is not possible, broadcast seeding would be implemented. If the broadcast method is used (such as on slopes of 40 percent or greater), the seed rates established for drill seeding would be doubled and seed would be immediately covered to prevent seed desiccation or predation by birds or rodents. The seeds may be covered in several ways including spreading and crimping straw over the seeded area, raking the area by hand, or dragging a chain or chain-linked fence over the seeded area.

2.1.8.4. Dry Hole/Abandoned Location

Abandoned well sites, roads and other disturbed areas would be restored as near as practical to their natural condition. Stockpiled topsoil would be spread across the recontoured area then seeded with a seed mixture approved by the BLM Authorized Officer (AO). Seed application would follow the methods outlined in Green River Reclamation Guidelines (BLM 2009). If reclamation seeding should take place using the broadcast method, the seed at a minimum would be walked into the soil with a dozer or other heavy equipment immediately after the seeding is completed. Reclamation of the well pad and access road would be done within six months, weather permitting, after final abandonment.

2.1.8.5. *Monitoring*

Prior to any surface disturbance, vegetative monitoring locations and reference sites would be identified by EOG Resources, Inc. and approved by the BLM Authorized Officer (AO). Vegetation monitoring protocol would be developed by EOG and approved by the BLM AO prior to implementation of revegetation techniques and would be designed to monitor basal vegetative cover. Revegetated areas would be inspected annually and monitored to document location and extent of areas with successful revegetation, and areas needing further reclamation. A reclamation report would be submitted to the Authorized Officer by March 31st of each year. On Federal lands, the reclamation objective would be a vegetation community that within 5 years is comprised of desired and/or seeded species, and where the basal vegetative cover is 75 percent of a similar undisturbed adjacent native vegetation community. If after 3 years basal cover is less than 30 percent, then additional seeding and reclamation efforts may be required, in order to help reach the 5 year goals.

2.1.9. Applicant Committed Measures

The applicant has agreed to the following measures to mitigate the effects of the proposal:

2.1.9.1. *Visual Resources*

Applicant has agreed to paint all facilities a standard environmental color, as determined by the Rocky Mountain Five State Interagency Committee, in order to help meet VRM IV guidelines. The goal is to reduce visual impacts through having all production equipment painted a non-reflective earth tone similar to the vegetation in the area. The facilities would be painted Covert Green, with the exception of facilities required to comply with the Occupational Safety and Health Act (OSHA).

2.1.9.2. *Cultural Resources*

A cultural resources survey was conducted on all areas where surface disturbance would occur (i.e., well locations, access roads, and pipelines). No sites considered eligible for inclusion into the National Register of Historic Places (NRHP) were located during the survey (U-04-AY-846). EOG would educate its contractors and employees about the relevant federal regulations intended to protect cultural resources. All vehicular traffic, personnel movement, construction and restoration activities would be confined to areas cleared by the site inventory and to existing roads. In the event historic or archeological resources are uncovered during construction, work would stop immediately and the appropriate BLM AO would be notified.

2.1.9.3. *Paleontological Resources*

A paleontological survey was conducted on all areas where surface disturbance would occur (i.e., well locations, access roads, and pipelines). No significant paleontological resources were observed during inventory of the Project Area (IPC-#06-85). The BLM paleontologist recommends that no paleontological restrictions should be placed on the proposed well locations and associated infrastructure. EOG would educate its contractors and employees about the relevant federal regulations intended to protect cultural resources. All vehicular traffic, personnel movement, construction, and restoration activities would be confined to areas cleared by the site

inventory and to existing roads. If any potential paleontological resources are uncovered during construction, work would stop immediately in the area and the appropriate BLM AO would be notified.

2.2. Description of Alternatives Analyzed in Detail:

No Action Alternative

Under the No Action Alternative, EOG would not construct and drill the two proposed wells in Section 10 Township 11 South, Range 19 East, Uintah County, Utah. However, other oil and gas development in the area would be expected to continue. Other current resource trends and land use practices would also continue. The BLM's authority to implement the No Action Alternative may be limited because oil and gas leases allow drilling in the lease area subject to the stipulations of the specific lease agreement, especially if it is an obligation well, meaning one well needs to be established on the lease in order for the company to keep the lease. The BLM can deny the application for permit to drill (APD) if the proposal would violate lease stipulations and applicable laws and/or regulations. The BLM can also impose conditions of approval to prevent undue or unnecessary environmental degradation. If the BLM were to deny the APD, the applicant could attempt to reverse the BLM's decision through administrative appeals, seek to exchange its lease for leases in other locations, or seek compensation from the federal government. The outcome of these actions is beyond the scope of this EA because they cannot be projected or meaningfully analyzed at this time.

2.3. Alternatives Considered but not Analyzed in Detail

No additional alternatives were considered.

2.4. Conformance

The proposed well(s) and related facilities would be in conformance with the Vernal Field Office RMP/ROD (signed October 31, 2008) and the terms of the lease(s). The RMP/ROD decision allows leasing of oil and gas while protecting or mitigating other resource values (RMP/ROD p. 96-98). The Minerals and Energy Resources Management Objectives encourage the drilling of oil and gas wells by private industry (RMP/ROD, p. 96). It has been determined that the Proposed Action and alternatives would not conflict with other decisions throughout the plan. The Project Area is entirely within the visual resources classification VRM IV as discussed in the 2008 Vernal BLM RMP/ROD. There are no applicable timing, no surface occupancy (NSO), or controlled surface use (CSU) Lease Stipulations for Federal Lease UTU-70848 in the Project Area. Cultural and paleontological surveys were required and have been submitted with the applicable APD(s).

The Proposed Action and the No Action Alternative are consistent with Federal, State, and local laws, regulations, and plans (see Sections 1.5.1 and 1.5.2 below).

Utah's Standards for Rangeland Health (BLM 1997) address upland soils, riparian/wetlands, desired and native species, and water quality. These resources are analyzed later in this document or, if not affected, are listed in Appendix A.

Federal Laws and Statutes

The subject lands were leased for oil or gas development under authority of the Mineral Leasing Act of 1920, as modified by the Federal Land Policy and Management Act of 1976, and the Federal Onshore Oil and Gas Leasing Reform Act of 1987. The lessee/operator has the right to explore for oil and gas on the lease as specified in 43 CFR 3103.1-2, and if a discovery is made, to produce oil and/or natural gas for economic gain.

State and Local Laws and Statutes

There are no comprehensive State of Utah plans for the vicinity of the Proposed Action.

The proposed project is consistent with the *Uintah County Public Land Use Plan* (County Plan) (2012) that encompasses the location of the proposed wells. In general, the plan indicates support for development proposals such as the proposed action through the plan's emphasis on multiple-use public land management practices, responsible use and optimum utilization.

The State of Utah School and Institutional Trust Lands Administration (SITLA) have leased much of the nearby state land for oil and gas production. Because the objectives of SITLA are to produce funding for the state school system, and because production on Federal leases could further interest in drilling on state leases in the area, it is assumed that the alternatives analyzed, with the exception of the No Action Alternative, are consistent with the objectives of the state.

Chapter 3. Affected Environment:

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The affected environment of the Proposed Action and No Action Alternative were considered and analyzed by an interdisciplinary team, as documented in the Interdisciplinary Team Analysis Record Checklist (Appendix A). The checklist indicates which resources of concern are present, would be affected by the action, and would require analysis in the EA, or are either not present in the Project Area or would not be affected to a degree that requires detailed analysis.

General Setting

The wells would be located approximately 53 air miles south of Vernal, Utah in Uintah County (see Map 1). The precipitation is typically between 4 to 8 inches yearly on average in a black sagebrush vegetative community, with moderate to moderately rapid permeability based off soil survey data in the area. Elevation in the Project Area is an average of approximately 5,610 feet above ground level (GL).

3.1. Resources and Issues Brought Forward for Analysis

3.1.1. Air Quality and Greenhouse Gases

3.1.1.1. Air Quality

The Project Area is located in the Uinta Basin, a semiarid, mid-continental climate regime typified by dry, windy conditions, limited precipitation and wide seasonal temperature variations subject to abundant sunshine and rapid nighttime cooling. The Uinta Basin is designated as unclassified/attainment by the EPA under the Clean Air Act. This classification indicates that the concentration of criteria pollutants in the ambient air is below National Ambient Air Quality Standards (NAAQS), or that adequate air monitoring is not available to determine attainment.

NAAQS are standards that have been set for the purpose of protecting human health and welfare with an adequate margin of safety. Pollutants for which standards have been set include ground level ozone, (O₃), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), carbon monoxide (CO), and particulate matter less than 10 microns in diameter (PM₁₀) or 2.5 microns in diameter (PM_{2.5}). Airborne particulate matter consists of tiny coarse-mode (PM₁₀) or fine-mode (PM_{2.5}) particles or aerosols combined with dust, dirt, smoke, and liquid droplets. PM_{2.5} is derived primarily from the incomplete combustion of fuel sources and secondarily formed aerosols, whereas PM₁₀ is primarily from crushing, grinding, or abrasion of surfaces. Table 3.1, “Air Quality Regulatory Backgrounds for the Uinta Basin” (p. 16) lists ambient air quality background values for the Uinta Basin and NAAQS standards.

Table 3.1. Air Quality Regulatory Backgrounds for the Uinta Basin

Pollutant	Averaging Period(s)	Uinta Basin Background Concentration ($\mu\text{g}/\text{m}^3$)	NAAQS ($\mu\text{g}/\text{m}^3$)
SO ₂	Annual	0.8 ²	-- ¹
	24-hour	3.9 ²	-- ¹
	3-hour	10.1 ²	1,300
	1-hour	19.0 ²	197
NO ₂	Annual	17	100
	1-hour	8.1 ³	188
		60.2 ³	
PM ₁₀	Annual	7.0 ⁴	-- ⁶
	24-hour	16.0 ⁴	150
PM _{2.5}	Annual	9.4 ³	15
	24-hour	17.8 ³	35
CO	8-hour	3,450 ⁴	10,000
CO	1-hour	6,325 ⁴	40,000
O ₃	8-hour	100.0 ^{3,5}	75
<p>1 – The 24-hour and annual SO₂ NAAQS have been revoked by USEPA.</p> <p>2 – Based on 2009 data from Wamsutter Monitoring Station Data (USEPA AQS Database).</p> <p>3 – Based on 2010/2011 data from Redwash Monitoring Station (USEPA AQS Database).</p> <p>4 – Based on 2006 data disclosed in the Greater Natural Buttes FEIS. (BLM, 2012).</p> <p>5 – Ozone is measured in parts per billion (ppb)</p> <p>6 – The annual PM₁₀ NAAQS has been revoked by USEPA.</p>			

Existing point and area sources of air pollution within the Uinta Basin include the following:

- Exhaust emissions (primarily CO, NO_x, PM_{2.5}, and HAPs) from existing natural gas fired compressor engines used in transportation of natural gas in pipelines;
- Natural gas dehydrator still-vent emissions of CO, NO_x, PM_{2.5}, and HAPs;
- Gasoline and diesel-fueled vehicle tailpipe emissions of VOCs, NO_x, CO, SO₂, PM₁₀, and PM_{2.5};
- Oxides of sulfur (SO_x), NO_x, fugitive dust emissions from coal-fired power plants, and coal mining/ processing;
- Fugitive dust (in the form of PM₁₀ and PM_{2.5}) from vehicle traffic on unpaved roads, wind erosion in areas of soil disturbance, and road sanding during winter months; and,
- Long-range transport of pollutants from distant sources.

Two year-round air quality monitoring sites were established in summer 2009 near Red Wash (southeast of Vernal, Utah) and Ouray (southwest of Vernal). These monitors were certified as Federal Reference Monitors in fall of 2011, which means they can be used to make a NAAQS compliance determination. The complete EPA Ouray and Redwash monitoring data can be found at: <http://www.epa.gov/airexplorer/index.htm>

Both monitoring sites have recorded numerous exceedences of the 8-hour ozone standard during the winter months (January through March 2010, 2011, 2013, and 2014). It is thought that high concentrations of ozone are being formed under a “cold pool” process. This process occurs when stagnate air conditions form with very low mixing heights under clear skies, with snow-covered ground, and abundant sunlight. These conditions, combined with area precursor emissions (NO_x and VOCs), can create intense episodes of ozone. The high numbers did not occur in January through March 2012 due to a lack of snow cover. This phenomenon has also been observed in similar locations in Wyoming. Winter ozone formation is a newly recognized issue, and the methods of analyzing and managing this problem are still being developed. Existing photochemical models are currently unable to reliably replicate winter ozone formation. This is due to the very low mixing heights associated with unique meteorology of the ambient conditions. Further research is needed to definitively identify ozone precursor sources that contribute to observed ozone concentrations.

The UDAQ conducted limited monitoring of $\text{PM}_{2.5}$ in Vernal, Utah in December 2006. During the 2006-2007 winter seasons, $\text{PM}_{2.5}$ levels were higher than the $\text{PM}_{2.5}$ health standards that became effective in December 2006. The $\text{PM}_{2.5}$ levels recorded in Vernal were similar to other areas in northern Utah that experience wintertime inversions. The most likely causes of elevated $\text{PM}_{2.5}$ at the Vernal monitoring station are those common to other areas of the western U.S. (combustion and dust) plus nitrates and organics from oil and gas activities in the Basin. $\text{PM}_{2.5}$ monitoring that has been conducted in the vicinity of oil and gas operations in the Uinta Basin by the Red Wash and Ouray monitors beginning in summer 2009 have not recorded any exceedences of either the 24 hour or annual NAAQS.

HAPs are pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental impacts. The EPA has classified 187 air pollutants as HAPs. Examples of listed HAPs associated with the oil and gas industry include formaldehyde, benzene, toluene, ethylbenzene, isomers of xylene (BTEX) compounds, and normal-hexane (n-hexane). There are no applicable Federal or State of Utah ambient air quality standards for assessing potential HAP impacts to human health.

3.1.1.2. Greenhouse Gases

Greenhouse gases keep the planet's surface warmer than it otherwise would be. According to NOAA and NASA data, the Earth's average surface temperature has increased by about 1.2 to 1.4° F in the last 100 years. The eight warmest years on record (since 1850) have all occurred since 1998, with the warmest year being 1998. However, according to the British Meteorological Office's Hadley Centre (BMO 2009), the United Kingdom's foremost climate change research center, the mean global temperature has been relatively constant for the past nine 18 years after the warming trend from 1950 through 2000. Predictions of the ultimate outcome of global warming remain to be seen.

The analysis of the Regional Climate Impacts prepared by the U.S. Global Change Research Program (USGCRP) in 2009 suggests that recent warming in the region (including the project

area) was nationally among the most rapid. Past records and future projections predict an overall increase in regional temperatures, largely in the form of warmer nights and effectively higher average daily minimum temperatures. They conclude that this warming is causing a decline in spring snowpack and reduced flows in the Colorado River. The USGCRP projects a region-wide decrease in precipitation, although with substantial variability in interannual conditions. For eastern Utah, the projections range from an approximate 5 percent decrease in annual precipitation to decreases as high as 40 percent of annual precipitation.

Equilibrium climate sensitivity quantifies the response of the climate system to constant radiative forcing on multicentury time scales. It is defined as the change in global mean surface temperature at equilibrium that is caused by a doubling of the atmospheric CO₂ concentration. Equilibrium climate sensitivity is likely in the range 1.5°C to 4.5°C (high confidence), extremely unlikely less than 1°C (high confidence), and very unlikely greater than 6°C (medium confidence). The lower temperature limit of the assessed likely range is thus less than the 2°C in the AR4, but the upper limit is the same. This assessment reflects improved understanding, the extended temperature record in the atmosphere and ocean, and new estimates of radiative forcing. No best estimate for equilibrium climate sensitivity can now be given because of a lack of agreement on values across assessed lines of evidence and studies (IPCC, 2013).

3.1.2. Soils and Vegetation

The soils in the area are typically mixed with a high content of sandy loams. According to NRCS soil survey data (2014, WSS query) the soils in the area are considered Lanver-Walknolls association.

The Lanver-Walknolls association is well drained, nearly level to significantly sloping (2 to 25% slopes) soils found on plateaus and hills at elevations from 5,200 to 6,000 feet. The parent materials are eolian deposits over residuum derived from sandstone and shale and slope alluvium derived from sandstone. Surface layer is very channery sandy loam 0 to 3 inches thick; upper subsoil, where present, is very channery sandy loam about 10-14 inches thick. The permeability is moderate to moderately rapid, runoff is medium and erosion hazard is moderate. The land capability subclass is 7s if nonirrigated, which indicates that the soils are generally not suited to the mechanized production of commonly grown field crops without special management, and that the soils are limited mainly because they are salty, shallow, droughty, or stony. The ecological site classification is semidesert gravelly sandy loam (Wyoming big sagebrush) or semidesert shallow loam (black sagebrush).

The Project Area is located in a black sagebrush community. Dominant species that occur in the Project Area include Indian ricegrass (*Achnatherum hymenoides*), shortawn foxtail (*Alopecurus aequalis*), black sagebrush (*Artemisia nova*), Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*), milkvetch sp. (*Astragalus* sp.), shadscale (*Atriplex confertifolia*), Gardner saltbush (*Atriplex gardneri*), blue grama (*Bouteloua gracilis*), Indian paintbrush sp. (*Castilleja* sp.), rubber rabbitbrush (*Chrysothamnus nauseosus*), purple springparsley (*Cymopterus purpureus*), bottlebrush squirreltail (*Elymus elymoides*), Mormon tea (*Ephedra viridis*), slender buckwheat (*Erigonum microthecum*), spiny hopsage (*Grayia spinosa*), broom snakeweed (*Gutierrezia sarothrae*), hoary tansyaster (*Machaeranthera canescens*), plains pricklypear (*Opuntia polyacantha*), budsage (*Picrothamnus desertorum*), galleta grass (*Pleuraphis jamesii*), black greasewood (*Sarcobatus vermiculatus*), scarlet globemallow (*Sphaeralcea coccinea*), and spineless horsebrush (*Tetradymia canescens*).

No noxious weeds were observed during the onsite investigation, and none have been previously documented in the Project Area. The invasive species cheatgrass (*Bromus tectorum*), halogeton (*Halogeton glomeratus*), and Russian thistle (*Salsola iberica*) were observed during the onsite investigation.

3.1.3. Livestock Grazing

The project proposed is located in the Wild Horse Bench Allotment; used for winter sheep grazing. The allotment boundary was modified in the permit renewal of 2009 to include both the Lower Showalter and Wild Horse Bench Allotments. The cattle AUMs of the Lower Showalter Allotment were converted to sheep AUMs at this time. However, the BLM is currently analyzing the conversion of those sheep AUMs to cattle AUMs at a reduced rate through an active ongoing NEPA document. The allotment is primarily located within the semi arid salt scrub ecosystem; undisturbed characterized by native low-lying shrubs, grasses and forbs. Disturbed areas of the Wild Horse Bench Allotment are currently characterized by invasive weeds such as halogeton (*Halogeton glomeratus*) and cheat grass (*Bromus tectorum*) as well as bare ground. The allotment is currently dissected by hundreds possibly thousands of miles of pipelines, roads and road spurs, as well as other infrastructure such as compressor stations, which characterizes dense oil and gas development.

The current livestock operator has been unable to utilize his full permitted AUMs within the Allotment due to the current level of disturbance, fragmentation, daily traffic and development

RANGELAND HEALTH STANDARDS:

Rangeland Health Standards were assessed for the Wild Horse Bench Allotment in 2005; however since then, a large portion of the vegetative surface has been removed and/or disturbed as a result of the development of oil and gas resources in the area. The area had assessments carried out during the 2014 field season.

The allotment is primarily located within the semi arid salt scrub ecosystem; undisturbed characterized by low-lying shrubs, grasses and forbs. Disturbed areas of Allotment are currently characterized by invasive weeds such as halogeton (*Halogeton glomeratus*) and cheat grass (*Bromus tectorum*) as well as bare ground.

3.1.4. Wildlife: Migratory Birds (including raptors)

All migratory birds and their nests are protected from take or disturbance under the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C., 703 et seq.). These protection laws were implemented for the protection of avian species. Unless permitted by regulations, it is unlawful to pursue, hunt, kill, capture, possess, buy, sell, purchase, or barter any species covered under these Acts. In addition, Executive Order 13186 sets forth the responsibilities of federal agencies to further implement the provisions of these Acts by integrating bird conservation principles and practices into agency activities and by ensuring that federal actions evaluate the effects of actions and agency plans on protected avian species.

The BLM has reviewed district files and completed a field visit for raptor nesting and migratory bird habitat within all lands up to ½ mile of the project wells. There are no known nests within ½ mile of the project area. The following addresses migratory birds that may utilize the project area for nesting or foraging activities, including those species classified as Priority Species by Utah

Partners-in-Flight. Utah Partners-in-Flight is a cooperative partnership among federal, state, and local government agencies as well as public organizations and individuals organized to emphasize the conservation of birds not covered by existing conservation initiatives.

Desert/Shrub Areas: American robin, black-billed magpie, black-throated sparrow, bobolink, Brewer's blackbird, Brewer's sparrow, common raven, mountain bluebird, sage sparrow, sage thrasher, and western kingbird.

3.1.5. Wildlife: Threatened, Endangered, Proposed or Candidate

The USFWS has identified four federally listed fish species historically associated with the Upper Colorado River Basin as being impacted through water depletions: bonytail, Colorado pikeminnow, humpback chub, and razorback sucker. These fish are federally and state-listed as endangered and have experienced severe population declines due to flow alterations, habitat loss or alteration, and the introduction of non-native fish species.

Approximately 3 acre-feet of fresh water for drilling and cementing purposes would be obtained from any of the following sources: Ouray Municipal Water Plant or Bonanza Power Plant water source (water right number 49-225(A31368)). The Ouray Municipal Water Plant and Bonanza Power Plant water source are considered historic depletions as they were permitted prior to the January 1988 date set for new (non-historic) depletions under the 1993 Recovery Implementation Program.

Chapter 4. Environmental Effects:

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The potential direct, indirect, and cumulative impacts from Alternative A (the Proposed Action) and Alternative B (the No Action Alternative) are discussed in the following sections of Chapter 4. Direct impacts to soils and vegetation in the following analyses are described as short-term and long-term impacts. In areas where interim reclamation is implemented, ground cover by herbaceous and woody species could be re-established within seven to eight years following seeding of native plant species and diligent weed control efforts. These reclaimed areas are categorized as short-term disturbance. However, it is important to note that recent BLM monitoring has documented that reclamation efforts for oil and gas development have largely been unsuccessful at re-establishing soil stability, vegetation, and subsequent forage for wildlife and livestock. The ongoing drought, coupled with the area's poor soil reclamation potential, has made successful reclamation efforts challenging. BLM field inspections indicate that short-term impacts may be more accurately portrayed as long-term impacts. Thus, while the following analyses distinguish between short-term and long-term soil and vegetation losses, it is important to note that surface disturbance proposed under the alternatives could remain as long-term impacts on the landscape if reclamation efforts are not successful.

4.1. Proposed Action Alternative

4.1.1. Air Quality and Greenhouse Gases

4.1.1.1. Air Quality

This Proposed Action is considered to be a minor air pollution source under the Clean Air Act at present control technology on some emissions sources (e.g. drill rigs) is not required by regulatory agencies. The Proposed Action would result in different emission sources associated with two project phases: well development and well production. Annual estimated emissions from the Proposed Action are summarized in Table 4.1, “Anticipated Emissions ¹” (p. 23).

Table 4.1. Anticipated Emissions ¹

Pollutant	Development	Production	Total
NO _x	14.2	2.2	16.4
CO	3.2	3.2	6.4
SO _x	0.9	0	0.9
PM ₁₀	0.7	0.03	0.73
PM _{2.5}	0.3	0.01	0.31
VOC	2.5	6.5	9.0
Benzene	0.03	0.13	0.16
Toluene	0.02	0.09	0.11
Ethylbenzene	0.02	0.22	0.24
Xylene	0	0.07	0.07
n-Hexane	0.05	0.08	0.13
Formaldehyde	0	0	0
¹ Emissions include one producing well and associated operations traffic during the year in which the project is developed			

Well development includes NO_x, SO₂, and CO tailpipe emissions from earth-moving equipment, vehicle traffic, drilling, and completion activities. Fugitive dust concentrations would occur from vehicle traffic on unpaved roads and from wind erosion where soils are disturbed. Drill rig and

fracturing engine operations would result mainly in NO_x and CO emissions, with lesser amounts of SO₂. These emissions would be short-term during the drilling and completion phases.

During well production, continuous NO_x, CO, VOC, and HAP emissions would originate from well pad separators, condensate storage tank vents, and daily tailpipe and fugitive dust emissions from operations traffic. Road dust (PM₁₀ and PM_{2.5}) would also be produced by vehicles servicing the wells.

Emissions of NO_x and VOC, ozone precursors, for a single well are estimated to be 16.4 tons/yr for NO_x, and 9.0 tons/yr of VOC (Table 4.1, "Anticipated Emissions ¹" (p. 23)) per well. Emissions would be dispersed and/ or diluted to the extent where any local ozone impacts from the Proposed Action would be indistinguishable from background conditions.

The primary sources of HAPs are from oil storage tanks and smaller amounts from other production equipment. Small amounts of HAPs are emitted by construction equipment. These emissions are estimated to be minor and less than one ton per year.

4.1.1.1.1. Green House Gas

The assessment of greenhouse gas emissions and climate change remains in its earliest stages of formulation. Applicable EPA rules do not require any controls and have yet to establish any emission limits related to GHG emissions or impacts. The lack of scientific models that predict climate change on regional or local level prohibits the quantification of potential future impacts of decisions made at the local level, particularly for small scale projects such as the Proposed Action. Drilling and development activities from the Proposed Action are anticipated to release a negligible amount of greenhouse gases into the local air-shed.

4.1.2. Soils and Vegetation

Impacts to soils and vegetation would be partially mitigated by reclamation of disturbed areas with desired native vegetation and the control of noxious and invasive weeds by mechanical and chemical treatment (see Section 2.2.8). Under the Proposed Action, reclamation would occur on approximately 25 percent of the well pad upon completion of drilling. The remaining 75 percent of the well pad would be revegetated after abandonment of the well (approximately 25 years). It is expected however, for the company to do interim reclamation on any unused portions of the well pad to stabilize as much of the site as possible. .

Immediately upon well completion, any hydrocarbons on the pit shall be removed. The reserve pit and that portion of the location not needed for production facilities/operations will be recontoured to the approximate natural contours. The reserve pit will be reclaimed within 90 days from the date of the well completion, or as soon as environmental conditions allow. The stockpiled topsoil will then be spread over the pit area and broadcast seeded with the prescribed seed mixture for this location. The seeded area will then be walked down with a cat.

The project would contribute an estimated additional 3.0 tons of soil per acre per year above the current natural erosion rate for the first year of development. After the first year, the soil erosion attributed to the project would reduce to 1.5 tons per acre per year until the access roads and well pads are fully reclaimed. Erosion rates are higher during the first year due to disturbance during construction.

Direct impacts to soils include mixing of soil horizons, soil compaction, short-term loss of topsoil and site productivity, and loss of soil/topsoil through wind and water erosion. Loss of soil/topsoil in disturbed areas would reduce the revegetation success of seeded native species due to increased competition by annual weed species. Annual weed species are adapted to disturbed conditions, and have less stringent moisture and soil nutrient requirements than do perennial native species.

Additional direct impacts to vegetation are primarily associated with clearing of vegetation during construction. Indirect impacts to vegetation resources include the invasion and establishment of introduced, undesired plant species. The severity of these invasions would depend on the success of reclamation and revegetation, and the degree and success of noxious weed control efforts. Long-term impacts to vegetation are expected for the life of the well (an average of 25 years or until reclamation is successful)

4.1.3. Livestock Grazing

Rangeland Health Standards and Guidelines

Rangeland Health assessments were conducted for this allotment during the 2014 field season. Increased disturbance and unsuccessful reclamation within these allotments may contribute to these allotments not meeting Utah Standards for Rangeland Health. Successful reclamation, weed monitoring, and invasive and noxious weed control would be required during the life of the proposed action. These measures would reduce additional negative impacts to Rangeland Health within the allotments.

Livestock Grazing

There would be approximately 10 acres of new disturbance associated with the proposed action which would require reclamation and noxious and invasive weed monitoring and control. Noxious and invasive weeds can displace native plants and reduce the amount of available forage. Some invasive weeds like Halogeton are poisonous to livestock. Halogeton is already present on the allotment so disturbance from this project would provide another potential area for Halogeton and other invasive and noxious weeds to establish.

Mitigation:

EOG has a site specific reclamation plan for the project area that follows the Green River District Reclamation Guidelines. Successful reclamation as defined in the Green River District Reclamation Guidelines will reduce the impacts of the project to livestock grazing and rangeland resources.

4.1.4. Wildlife: Migratory Birds (including raptors)

Project activities are anticipated to disturb approximately 9.77 acres of migratory bird foraging and nesting habitat. Given the abundance of foraging habitat in the surrounding area, habitat losses are not expected to reduce raptor prey bases to levels where “take” would occur. Impacts to migratory birds within the proposed project area would also be dependent upon the time when project activities would occur. If these activities occur in the late fall, most of the species would have left the area during winter migration. If construction activities were to occur during the spring or summer months it could cause birds to move into other adjacent habitats or into habitats where interspecific and intraspecific competition between species may increase. Surface and noise

disturbance associated with project activities would be considered temporary and is anticipated to occur during typical working hours; however, by following the mitigation measures for burrowing owl outlined below impacts to migratory birds would be minimized or completely negated.

4.1.5. Wildlife: Threatened, Endangered, Proposed or Candidate

The water used for this project would be obtained from the state water rights listed in Chapter 2, which are historic depletions (permitted prior to January 1988). The USFWS addresses new and historic depletions differently under the Section 7 agreement of March 11, 1993. Historic depletions, regardless of size, do not pay a depletion fee to the Recovery Program. Also, consultation for historic depletions was conducted in association with the 1993 agreement.

Implementation of the Proposed Action Alternative would directly impact the Upper Colorado River basin fishes. These impacts would remain until project completion. Water depletions from the Upper Colorado River Basin, along with a number of other factors, have resulted in such drastic reductions in the populations of the bonytail, Colorado pikeminnow, humpback chub, and razorback sucker. Water depletions reduce the ability of the river to create and maintain the primary constituent elements that define critical habitats. Food supply, predation, and competition are important elements of the biological environment. Food supply is a function of nutrient supply and productivity, which could be limited by reduction of high spring flows brought about by water depletions. Predation and competition from nonnative fish species have been identified as factors in the decline of the endangered fishes. Water depletions contribute to alterations in the flow regimes that favor nonnative fishes.

The Proposed Action Alternative would result in water depletion from removal of water from the Upper Colorado River Basin for project activities. Therefore, the Proposed Action will have a *“may affect, likely to adversely affect”* determination for the endangered Colorado River fish species.

4.2. Reasonably Foreseeable Development and Cumulative Impacts Analysis

Cumulative Impacts

Cumulative impacts are those impacts that result from the incremental impact of an action when added to other past, present, and reasonably foreseeable actions, regardless of which agency or person undertakes such other actions. The cumulative impacts analysis area (CIAA) varies by resource and would be defined in the section for each individual resource.

4.2.1. Air Quality

The cumulative impact area for air quality is the Uinta Basin, plus all regional Class I areas and other environmentally sensitive areas (e.g., national parks and monuments, wilderness areas, etc.) near the Uinta Basin. The Air Resource Management Strategy (ARMS) Modeling Project is a cumulative assessment of potential future air quality impacts associated with predicted oil and gas activity in the Uinta Basin (BLM, 2011). Consequently, past, present and reasonably foreseeable wells in the Uinta Basin are a part of the cumulative actions considered in this analysis. The ARMS is incorporated by reference and summarized below.

Chapter 4 Environmental Effects:

Wildlife: Threatened, Endangered, Proposed or Candidate

The ARMS Modeling Project predicted the following impacts to air quality and air quality related values for the 2010 typical year and four 2021 future year scenarios: 2021 on-the-books (OTB); 2021 Scenario 1 (NO_xcontrols); 2021 Scenario 2 (VOC controls); and 2021 Scenario 3 (NO_xand VOC controls).

- Ozone

- The highest modeled ozone occurs in the Uinta Basin study area regardless of model scenario, and all scenarios predict exceedences of the ozone NAAQS and state AAQS in the Uinta Basin.
- In the Uinta Basin, the ozone concentrations are highest during the winter period. In Class I and Class II areas outside the Uinta Basin study area, ozone concentrations are highest during the summer period.
- During non-winter months in the Uinta Basin the model predicts that ozone may exceed the NAAQS and state AAQS (Ambient Air Quality Standards); however, model-adjusted results from the MATS tool (which accounts for model performance biases) indicate that non-winter ozone concentrations are below the NAAQS and state AAQS for all monitors and areas analyzed. Also, the 2021 scenarios have minimal effect on model-predicted ozone concentrations during non-winter months.
- 2021 Scenario 2 tends to have the lowest 8-hour ozone concentration relative to all other 2021 scenarios (4th highest daily maximum is 3 ppb lower compared to the 2021 OTB Scenario). When comparing Scenario 2 to the OTB Scenario, a potential reduction in ozone concentrations occurs in the vicinity of the Ouray site (where the concentrations are already largest). There is no predicted ozone disbenefit associated with Scenario 2 mitigation measures (i.e., there is no area with predicted ozone increases relative to the OTB Scenario). This supports the assessment that peak ozone impacts are in VOC-limited areas.
- 2021 Scenarios 1 and 3 are predicted to have higher ozone impacts than either the 2010 Typical year and the 2021 OTB Scenario. Both scenarios predict a relatively large increase in ozone concentrations within the vicinity of Ouray indicating potential ozone disbenefits associated with NO_x control mitigation measures.

- NO₂, CO, SO₂, PM_{2.5}, and PM₁₀

- There are seven monitoring stations within the 4- km domain with daily PM_{2.5} concentrations that exceed the NAAQS and state AAQS in the baseline emissions inventory.
- All modeled NO₂, CO, SO₂, PM_{2.5}, and PM₁₀ values are well below the NAAQS and state AAQS in the Uinta Basin.
- The model-predicted PM_{2.5} and PM₁₀ concentrations may underestimate future impacts due to a negative model bias throughout the year in the 4-km domain with the largest bias occurring in summer (AECOM and STI 2014).
- Results from the MATS tool (which accounts for model performance biases) indicate that PM_{2.5} concentrations may exceed the NAAQS and state AAQS for select monitors and assessment areas in the 2010 Typical year. All 2021 scenarios predict that only one of these monitoring station would continue to exceed the NAAQS and state AAQS.

- No monitoring stations within the 4-km domain exceed the annual PM_{2.5} NAAQS and state AAQS during the 2010 typical or 2021 Scenarios.
- Two unmonitored areas within the Uinta Basin exceed the annual PM_{2.5} NAAQS and state AAQS during the 2010 typical year, and impacts in these areas tend to increase under 2021 Scenarios 1 and 2. Under 2021 Scenario 3, the annual PM₂ impacts decrease in the Uinta Basin due to combustion control measures.
- The 2021 scenarios generally have lower NO₂, CO, SO₂, PM_{2.5}, and PM₁₀ concentrations than the 2010 Typical Year scenario, except for within the Uinta Basin.
- Under the 2021 scenarios, all assessment areas are within the PSD (Prevention of Significant Deterioration) increments for annual NO₂, 3-hour SO₂, annual SO₂, and annual PM₁₀.
- Under the 2021 scenarios, most assessment areas exceed the 24-hour PM_{2.5} PSD increment.
- Visibility
 - Visibility conditions in Class I and sensitive Class II areas generally show improvement in the 2021 Scenarios relative to the 2010 Typical Year.
 - There also are no substantial differences in the 20th percentile best and worst visibility days between the 2021 Scenarios.
- Deposition and Acid Neutralizing Capacity
 - Results generally show a decrease in deposition for the 2021 Scenarios relative to the 2010 Typical Year.
 - The differences in estimated deposition between the 2021 Scenarios are generally very small.
 - Acid Neutralizing Capacity change at all seven sensitive lakes exceeds the 10 percent limit of acceptable change for all model scenarios.

It is anticipated that the impact to ambient air quality and air quality related values associated with the Proposed Action would be indistinguishable from and dwarfed by the model and emission inventory scope and margin of error. The No Action alternative would not result in an accumulation of impacts.

4.2.1.1. Greenhouse Gas

It is not currently possible to determine a climate change impact from project specific GHG emissions, nor is it possible to assign a significance value to project specific GHG emissions. GHG emissions will be reported per guidance established by CEQ and the Interagency Air Quality MOU (USDA/USDOI, 2011). Drilling and development activities from the Proposed Action are anticipated to release a negligible amount of greenhouse gases, into the local airshed, resulting in a negligible cumulative impact. The No Action Alternative would not result in an accumulation of impacts.

4.2.2. Soils and Vegetation

Analysis of the cumulative impacts is incorporated by reference to the existing document Vernal Field Office Resource Management Plan and Record of Decision. For the purpose of cumulative impact analysis, the cumulative impacts analysis area (CIAA) considered is the boundary of the Township 11 South, Range 19 East (T11S R19E). Cumulative impacts typical of oil and gas field development include: removal of native vegetation and increased erosion rates of soils which are generally very thin, slow to develop, and difficult to reclaim due to the arid climate and the low organic content.

The CIAA considered for this analysis is the boundary of the T11S, R19E. Cumulative actions within the T11S, R19E area include a number of plugged and active wells primarily on BLM surface. BLM acreage within this area is approximately 11,348.17 acres of the total 22,800.39 acres in the township and range. There are currently several wells proposed in this township and range, including the 2 wells in the Proposed Action. These are currently the only wells proposed in Section 10 T11S R19E on BLM surface. The Proposed Action would disturb approximately 9.77 acres, approximately 0.043% of the CIAA (T11S R19E), or approximately 0.085 % of the total BLM acreage in the CIAA. The No Action Alternative would not contribute to cumulative impacts on soils and vegetation.

Soil erosion would be increased due to the disturbance associated with oil and gas activities in the area. Each acre of disturbance adds to a cumulative effect by increasing erosion and destroying native vegetation, and through the invasion of undesirable and/or non-native plant species. In general, soils in the Uinta Basin are very thin, slow to develop, and difficult to reclaim because of the arid climate and lack of organic material.

Direct surface disturbances to vegetation indicated by past, present, and reasonably foreseeable developments are primarily attributable to oil and gas development and vegetation management by various federal agencies. Oil and gas development, however, would continue to degrade local habitat by direct disturbance and slow reclamation of disturbed areas. The Proposed Action would add 9.77 acres of surface disturbance. The No Action alternative would not result in an accumulation of impacts.

4.2.3. Livestock Grazing

The CIAA for Rangeland Resources is the Wild Horse Bench Allotment. The allotment includes approximately 43,526 acres, (39,426 acres of BLM, 3,901 acres of SITLA, and 235 acres of tribal land). Within the CIAA, competition for grazing resources currently exists as a result of disturbance from oil and gas energy development, an influx of wintering bison and trespass cattle from neighboring tribal lands, as well as resident wild horses. Reclamation techniques have generally been unsuccessful. Invasive species such as: halogeton, tumble weed, tumble mustard and cheatgrass usually dominated disturbed sites throughout the CIAA. The current landscape within the CIAA is heavily fragmented from multiple miles of surface pipelines, roads, well pads (abandoned and active), compressor stations, and other infrastructure typically associated with the oil and gas industry. The following table depicts known disturbance as well as foreseeable (*APD well locations*). Cumulative disturbance for the CIAA is approximately 5,754 acres and 130 miles of ancillary roads. Therefore, it is currently estimated that more than 13% of the surface has been or will be disturbed through past, present and ongoing activities. The Proposed Action will contribute 10 acres to the overall cumulative disturbance, effectively 0.4% of the

cumulative amount of disturbance. The No Action alternative will not contribute additional disturbance impacts to the CIAA.

4.2.4. Wildlife: Migratory Birds (including raptors)

The cumulative impact analysis area for migratory birds is defined as the Sheep Wash-Green River Hydrologic Unit Boundary consisting of approximately 135,941 acres. This hydrologic unit boundary was chosen for cumulative impact analysis as this best represents a soil and vegetation habitat type avian species found within the project area would utilize in whole. Future actions of the Proposed Action could increase human presence in the area continuing to fragment and manipulate the surrounding habitats by increasing the presence of non-native invasive plant species. Further introduction of non-native invasive plant species could have significant adverse impacts on migratory birds that are dependent upon prevalent species for their survival. In general such an environmental shift would probably have negative impacts on wildlife species and would favor non-native and readily adaptive species.

Impacts to migratory birds in the cumulative impact analysis area would be dependent upon the season of project activities. Any activities completed in the late fall would less likely have a direct impact to avian species because many of the species would have left for winter grounds. In addition to displacement caused by project activities the Proposed Action Alternative would also result in the removal of up to approximately 9.77 acres of potential nesting and foraging habitat for migratory birds. The No Action Alternative would not result in an accumulation of impacts.

4.2.5. Wildlife: Threatened, Endangered, Proposed or Candidate

Cumulative effects include the effects of the future state, tribal, local, or private actions that are reasonably certain to occur within the upper Colorado River Basin. Declines in the abundance or range of many special status species have been attributed to various human activities on federal, state, and private lands, such as human population expansion and associated infrastructure development; construction and operation of dams along major waterways; water retention, diversion, or dewatering of springs, wetlands, or streams; recreation, including off-road vehicle activity; expansion of agricultural or grazing activities, including alteration or clearing of native habitats for domestic animals or crops; and introductions of nonnative plant, wildlife, or fish, or other aquatic species, which can alter native habitats or out compete or prey upon native species. Many of these activities are expected to continue on state and private lands within the range of the various federally protected wildlife, fish, and plant species, and could contribute to cumulative effects to the species within the project area. Species with small population sizes, endemic locations, or slow reproductive rates, or species that primarily occur on non-federal lands where landholders may not participate in recovery efforts, would be highly susceptible to cumulative effects.

Reasonably foreseeable future activities that may affect river-related resources in the area include oil and gas exploration and development, irrigation, urban development, recreational activities, and activities associated with the Upper Colorado River Endangered Fish Recovery Program. Implementation of all or any of these projects has affected and continues to affect the environment including, but not limited to, water quality, water rights, socioeconomic, and wildlife resources.

Chapter 5. Tribes, Individuals, Organizations, or Agencies Consulted And References

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List of Persons, Groups, and Agencies Consulted for Purposes of this EA:

Table 5.1.

Name	Purpose & Authorities for Consultation or Coordination	Findings & Conclusions
U.S. Fish and Wildlife Service	Water depletion impacting federally listed fish species including their associated critical habitats.	This project falls within the scope of the March 11, 1993 section 7 agreement; therefore consultation for the water depletion impacts to the four Colorado River fish and their designated critical habitat is complete.
Utah State Historic Preservation Office (SHPO)	Consultation for undertakings, as required by the National Historic Preservation Act (16 USC 470).	No cultural resources were identified within the project area. Utah SHPO concurrence was sent 10/14/2006
U.S. Fish and Wildlife Service	Water depletion impacting federally listed fish species including their associated critical habitats.	This project falls within the scope of the March 11, 1993 section 7 agreement; therefore consultation for the water depletion impacts to the four Colorado River fish and their designated critical habitat is complete.

Table 5.2. List of Preparers

Name	Title	Responsible for the Following Section(s) of this Document
Melissa Wardle	Natural Resource Specialist	Chapters 3&4: Air Quality and Soils, Appendices. Appendix A: Air Quality, Environmental Justice, Farmlands, Fuels/Fire, Invasive Plants/Noxious Weeds, Lands/Access, Socio-economics, Wastes, Water (excluding groundwater), Woodlands/Forestry.
Bill Civish	Outdoor Recreation Planner	Appendix A: BLM Natural Areas, Designated Areas, Lands with Wilderness Characteristics, Recreation, Visual Resources.
Leticia Neil	Archeologist	Appendix A: Cultural Resources, Native American Religious Concerns
Betty Gamber	Geologist/Paleontologist	Appendix A: Geology/Minerals/Energy Production, Paleontology, Groundwater Quality
Dusty Carpenter	Rangeland Management Specialist	Chapters 3&4: Livestock Grazing and Rangeland Health
Christine Cimiluca	Botanist	Appendix A: Plants
Brandon McDonald	Wildlife Biologist	Chapters 3&4: Fisheries and Wildlife Appendix A: Plants

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Chapter 6. References

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Appendix A. INTERDISCIPLINARY TEAM CHECKLIST

Project Title: EOG Resources, Inc. Proposes to Drill Two New Federal Gas Wells on BLM Surface in Alger Pass, Uintah County, Utah

NEPA Log Number: DOI-BLM-LLUTG010-2015-0033-EA

File/Serial Number: UTU-70848

Project Leader: Melissa Wardle

DETERMINATION OF STAFF: (Choose one of the following abbreviated options for the left column)

NP = not present in the area impacted by the proposed or alternative actions

NI = present, but not affected to a degree that detailed analysis is required

PI = present with potential for relevant impact that need to be analyzed in detail in the EA

NC = (DNAs only) actions and impacts not changed from those disclosed in the existing NEPA documents cited in Section D of the DNA form. The Rationale column may include NI and NP discussions.

Determination	Resource/Issue	Rationale for Determination	Signature	Date
RESOURCES AND ISSUES CONSIDERED (INCLUDES SUPPLEMENTAL AUTHORITIES APPENDIX 1 H-1790-1)				
PI	Air Quality & Greenhouse Gas Emissions	Emissions from construction, drilling, and production equipment could adversely affect air quality. No standards have been set by EPA or other regulatory agencies for greenhouse gases. In addition, the assessment of greenhouse gas emissions and climate change is still in its earliest stages of formulation. Global scientific models are inconsistent, and regional or local scientific models are lacking so that it is not technically feasible to determine the net impacts to climate due to greenhouse gas emissions. It is anticipated that greenhouse gas emissions associated with this action and its alternative(s) would be negligible.	Melissa Wardle	12/30/2014
NP	BLM Natural Areas	None Present as per GIS/RMP review.	Bill Civish	02/09/2015

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NP	Cultural: Archaeological Resources	A Class III inventory (Montgomery 2006: U-06-MQ-0540b) was completed for the project area. The results of this Class III inventory and data review indicated that no archaeological sites occur within the project area. Section 106 consultation with SHPO was initiated 10/14/2006 and completed on 11/14/2006. At that time, the determination of "No Historic Properties Affected" made by the BLM, VFO this received concurrence by the Utah SHPO.	Leticia Neal	03/23/2015
NP	Cultural: Native American Religious Concerns	No Traditional Cultural Properties (TCPs) are identified within the APE. The proposed project will not hinder access to or use of Native American religious sites. (U-06-MQ-540b)	Leticia Neal	03/23/2015
NP	Designated Areas: Areas of Critical Environmental Concern	None Present as per GIS/RMP review.	Bill Civish	02/09/2015
NP	Designated Areas: Wild and Scenic Rivers	No Wild and Scenic River segments exist within the identified Project Area according to VFO RMP and GIS review.	Bill Civish	02/09/2015
NP	Designated Areas: Wilderness Study Areas	No wilderness areas have been designated by the U. S. Congress on BLM lands in the VFO. No Wilderness Study Areas exist in the Project Area as per GIS review.	Bill Civish	02/09/2015
NI	Environmental Justice	Although the project is near the Uintah -Ouray Indian Reservation Boundary, no disproportional adverse impacts to minority or poverty populations is anticipated because the project is 14 miles from the nearest town and is similar to the other ongoing projects in the area.	Melissa Wardle	12/30/2014
NP	Farmlands (prime/unique)	No prime or unique farmlands as designated by the NRCS are present in the Project Area as per GIS review.	Melissa Wardle	12/30/2014
NI	Fuels/Fire Management	No fuels/fire management activities are planned or ongoing in the Project Area, per GIS review.	Melissa Wardle	12/30/2014

Determination	Resource/ Issue	Rationale for Determination	Signature	Date
NI	Geology/ Minerals/ Energy Production	<p>Encounters with gilsonite during any surface or drilling operation must be reported to the BLM Vernal Field Office. Please provide location, width of the vein, and depth encountered.</p> <p>Natural gas, oil, gilsonite, oil shale, and tar sand are the only mineral resources that could be impacted by the project. Production of natural gas or oil would deplete reserves, but the proposed project allows for the recovery of natural gas and oil per 43 CFR 3162.1(a), under the existing Federal lease. Compliance with “Onshore Oil and Gas Order No. 2, Drilling Operations” will assure that the project will not adversely affect gilsonite, oil shale, or tar sand deposits. Due to the state-of-the-art drilling and well completion techniques, the possibility of adverse degradation of tar sand or oil shale deposits by the proposed action will be negligible.</p> <p>Well completion must be accomplished in compliance with “Onshore Oil and Gas Order No. 2, Drilling Operations”. These guidelines specify the following: ... <i>proposed casing and cementing programs shall be conducted as approved to protect and/or isolate all usable water zones, potentially productive zones, lost circulation zones, abnormally pressured zones, and any prospectively valuable deposits of minerals. Any isolating medium other than cement shall receive approval prior to use.</i></p>	Betty Gamber	2/4/2015
IP/NW: NI Soils: PI Veg: PI	Invasive Plants/Noxious Weeds, Soils & Vegetation	<p>Invasive Plants/Noxious Weeds (IP/NW): Invasive and Noxious weeds are present in and near the Project Area. A weed management plan included with the site specific reclamation plan would be required. This would outline EOG’s plan for weed management, control and removal. If pesticides are to be used EOG must obtain a PUP from the BLM Authorized Officer. If weed management plan is followed, then an increase in weeds in the Project Area is not anticipated as a result of the Proposed Action.</p> <p>Soils: The proposed project takes place in areas identified as having sandy loam soils. The project proposes to disturb approximately 9.77 acres of these soils which are very prone to erosion through fluvial and eolian processes. These potential impacts have the chance to add significant amounts of new sediment into the system as a whole unless certain reclamation and storm water erosion controls methods are in place. A site specific reclamation plan would be required on the wells proposed in the proposed action.</p> <p>Veg: The proposed project takes place in areas identified as black sagebrush vegetative</p>	Melissa Wardle	12/30/2014

Determination	Resource/Issue	Rationale for Determination	Signature	Date
		community consisting of shrubs, grasses, and forbs, and typical of a High Desert or High Semi-Desert Ecosystem. The removal of the surface vegetation from this proposed action could cause increases in general sedimentation in down gradient environments. A site specific reclamation plan would be required to identify how EOG would handle interim reclamation and final reclamation.		
NI	Lands/Access	The Project Area is located within the Vernal Field Office Resource Management Plan area which allows for oil and gas development with associated road and pipeline right-of-ways. No BLM road, power line or pipeline right-of-ways would be required for the project prior to construction because the BLM portion is located entirely within Federal Lease UTU-70847. Surface use agreements with adjacent affected private land owners would be obtained by the operator prior to construction, if required. Other ROW holders in the area would need to be notified. No existing land uses would be changed or modified by the implementation of the proposed action; therefore there would be no adverse effect.	Melissa Wardle	12/30/2014
NP	Lands with Wilderness Characteristics (LWC)	None Present as per GIS/RMP review.	Bill Civish	02/09/2015
PI	Livestock Grazing & Rangeland Health Standards	The project has the potential to contribute cumulative impacts that may impact the livestock operations and 17 indicators of Rangeland Health.	Dusty Carpenter	03/03/2015
NP	Paleontology	No fossils were found at these sites (IPC #06–85, 5/9/06)	Betty Gamber	2/5/2015
NI	Plants: BLM Sensitive	<p>The following UT BLM Sensitive plant species are present or expected in the same or an adjacent subwatershed as the proposed project: <i>Yucca sterilis</i> and <i>Cryptantha grahamii</i>.</p> <ul style="list-style-type: none"> • Sandy soils in the vicinity of the proposed project may provide suitable habitat for <i>Yucca sterilis</i>. However, no populations are present in the Project Area and none were documented during the 2013 surveys of the host locations. Given the exclusively clonal nature of the species, the potential for future establishment is negligible. • Suitable habitat for Graham's catseye (<i>Cryptantha grahamii</i>) is on Green River shales in mixed desert shrub, sagebrush or mountain shrub vegetation elevations from 5,000 -7,400 feet. This habitat (Green River shale) is not present in the Project Area, and no populations or individuals have been documented in the Project Area per BLM GIS review. 	Christine Cimiluca	2/10/2015

Determination	Resource/ Issue	Rationale for Determination	Signature	Date
NI	Plants: Threatened, Endangered, Proposed, or Candidate	<p>The following Federally listed, proposed, or candidate plant species is present or expected in the same or an adjacent subwatershed as the proposed project: Pariette cactus (<i>Sclerocactus brevispinus</i>) and Uinta Basin hookless cactus (<i>Sclerocactus wetlandicus</i>).</p> <p>The Project Area is within suitable habitat for the 2 cactus species; however, the Project Area is outside the 2013 USFWS potential habitat polygon for <i>Sclerocactus ssp.</i> per BLM GIS data review. Habitat models produced by the University of Wyoming show a low potential for the 2 cactus species to occur in the Project Area. In addition, no individual plants or populations of the 2 species have been previously documented in the Project Area; the nearest known occurrence is located approximately 2.6 miles away, per BLM GIS data review. Due to the lack of documented plants in the Project Area and nearby, and the low potential for occurrence per habitat modeling, the proposed project is not anticipated to impact <i>Sclerocactus ssp.</i> or habitat.</p>	Christine Cimiluca	2/10/2015
NP	Plants: Wetland/ Riparian	No documented wetlands or riparian areas are present in the Project Area, per BLM GIS review.	Christine Cimiluca	2/10/2015
NI	Recreation	There is little OHV use and hunting associated within the project area. Therefore, recreation is not known to be an issue. The operator has committed to reclaiming the project area according to the Green River District Reclamation Guidelines, and has prepared a reclamation plan, which would help protect the scenic quality.	Bill Civish	02/09/2015
NI	Socio-Economics	No impact to the social or economic status of the county or nearby communities would occur from this project due to its small size in relation to ongoing development throughout the basin.	Melissa Wardle	1/5/2015
NI	Visual Resources	This location is in a VRM class of IV and this project is permitted as per the Vernal RMP within a class IV VRM.	Bill Civish	02/09/2015
NI	Wastes (hazardous/ solid)	No chemicals subject to reporting under SARA Title III in amounts greater than 10,000 pounds would be used, produced, stored, transported, or disposed of annually in association with the project. Trash and other waste materials would be cleaned up and removed immediately after completion of operations.	Melissa Wardle	1/5/2015
NI	Water: Floodplains	There are no mapped 100-year floodplains within the Project Area, as per BLM GIS data review. The nearest mapped 100-year floodplain is the Hill Creek 100-year floodplain, approximately 2.8 miles to the east. This floodplain is not expected to be impacted as a result of the Proposed Action.	Melissa Wardle	1/5/2015

Determination	Resource/Issue	Rationale for Determination	Signature	Date
NI	Water: Groundwater Quality	Groundwater: Compliance with “Onshore Oil and Gas Order No. 1, will assure that the project will not adversely affect groundwater quality. Due to the state-of-the-art drilling and wells completion techniques, the possibility of adverse degradation of groundwater quality or prospectively valuable mineral deposits by the proposed action will be negligible	Betty Gamber	2/4/2015
NI	Water: Hydrologic Conditions (stormwater)	The Project Area is located within the boundaries of the Lower Green-Desolation Canyon, Sheep Wash-Green River, and Kings Canyon-Green River Hydrologic Units. Hydrologic conditions within the Project Area consist primarily of dry ephemeral drainages within a sandy loam soil environment. The proposed action as stated is not expected to alter current hydrological conditions. Storm water controls within the site specific reclamation would address mitigation intended to protect current hydrologic conditions.	Melissa Wardle	1/5/2015
NI	Water: Surface Water Quality	The Project Area has been identified as having several ephemeral drainages that are subject to periodic fluctuations in surface runoff. Alterations in surface water quality could result due to the Proposed Action. However, mitigation measures and best management practices would minimize any potential impacts.	Melissa Wardle	1/5/2015
NP	Water: Waters of the U.S.	No Waters of the U.S. are present in the Project Area, as per BLM GIS data review and onsite review.	Melissa Wardle	1/5/2015
NI	Wild Horse and Burro	The Project Area is within the Hill Creek Wild Horse and Burro Herd Area per BLM GIS database. Under the VFO RMP/ROD wild horses are to be removed from the Hill Creek herd area. The Proposed Action is not expected to impact these management actions. The proposed project is located within the Hill Creek Herd Area, which prior to the 2008 ROD was designated as a Herd Management Area with an Appropriate Management Level or AML. However, until the horses are gathered, removed and the herd determined to be “zeroed” out, the horses will continue to be managed for. The last count of the horse herd was estimated to be ~300 in the summer of 2014. The horses are currently utilizing the Wild Horse Bench area in small bands (<10); occasionally larger bands of 10 or more may be observed during the winter months. The horses currently compete for forage resources with livestock and an increased wintering Bison herd, as well as trespass livestock from neighboring tribal lands. The portion of Wild Horse Bench within the HA has been developed for energy resources.	Dusty Carpenter	5/20/14

Determination	Resource/Issue	Rationale for Determination	Signature	Date
PI	Wildlife: Migratory Birds (including raptors)	The project is anticipated to disturb approximately 9.77 acres of migratory bird nesting/foraging habitat. In addition, there are no known raptor nests within 0.5 miles of the project wells.	Brandon McDonald	02/09/2015
NI	Wildlife: Non-USFWS Designated	District files and a field visit was reviewed and the BLM has determined that the project area does not contain crucial habitat for any given wildlife species.	Brandon McDonald	02/09/2015
PI	Wildlife: Threatened, Endangered, Proposed or Candidate	In review of district files and a field visit there are no threatened, endangered, proposed or candidate animals within the project area; however, water depletions are anticipated to occur. Is the proposed project in sage grouse PPH or PGH? No If the answer is yes, the project must conform with WO IM 2012-043,	Brandon McDonald	02/09/2015
NP	Woodlands/Forestry	No Woodland or Forestry resources are present in the Project Area.	Melissa Wardle	1/5/2015

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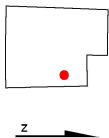
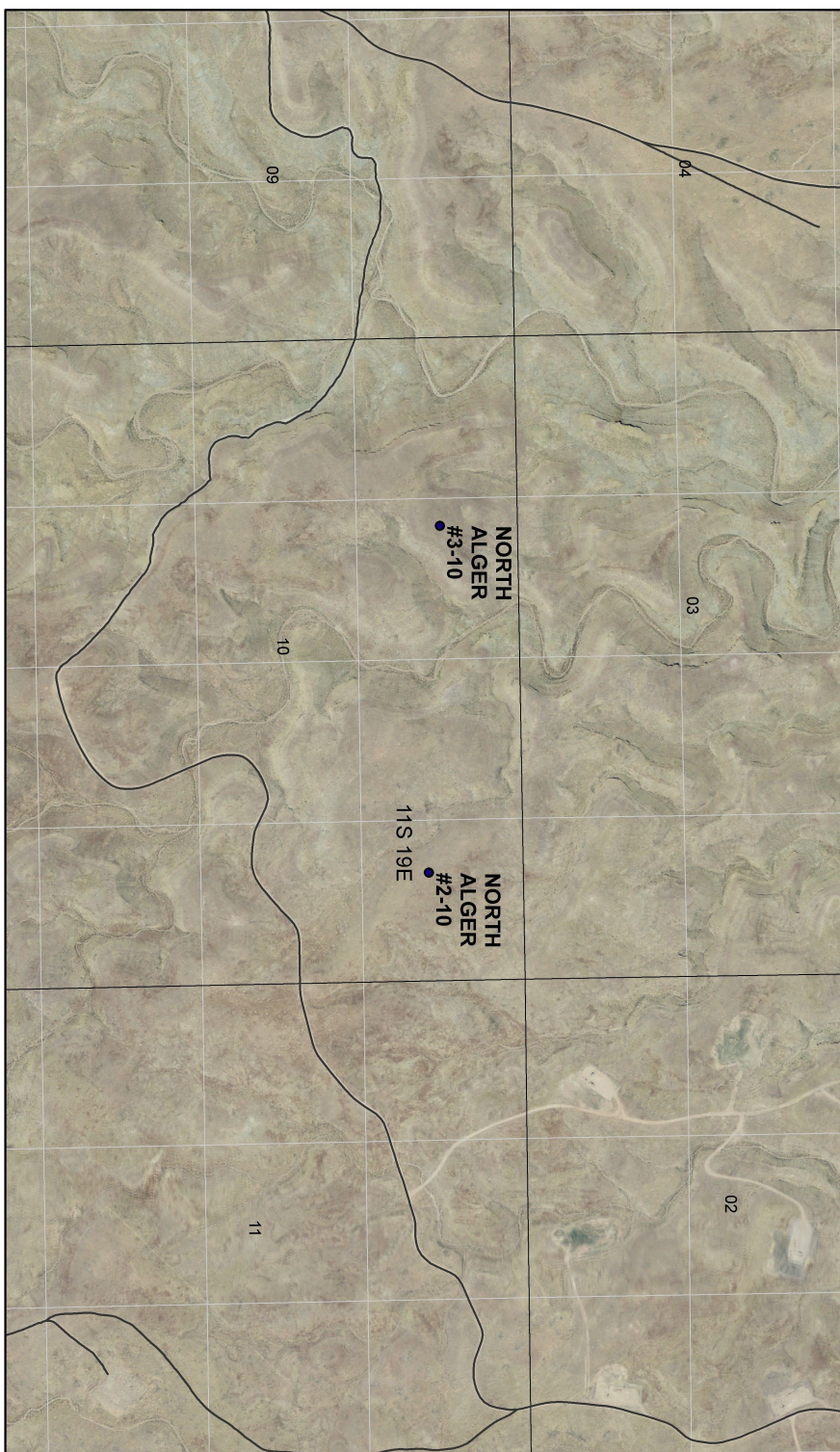
Appendix B. Maps

2/24/2015

North Alger 2-10 and 3-10 Well Locations

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T 11S



No warranty is made by the BLM for use of the data for purposes not intended by the BLM.

This product may not meet BLM standards for accuracy and content. Different data sources and input scales may cause some misalignment of data layers.



BLM

Appendix B Maps